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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,777	09/22/2000	Mitsuaki Komino	08038.0044	1267

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EXAMINER	
ZERVIGON, RUDY	
ART UNIT	**PAPER NUMBER**
1763	6

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/667,777	KOMINO ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1763	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 0200* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 6, 2003 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Sagusa et al (JP09-165681)[1]. Sagusa teaches an electrode (Figure 1B, 4) including:

i. A heater ("sheath heater 11"; [0011] computer translation) arranged in a plane

ii. An upper and lower ceramic-metal composite (12, "cordierite (2MgO, $2Al_2O_3$, and $5SiO_2$) of ceramics" [0012]) arranged above and below the heater (Figure 1B)

iii. Wherein the heater and the upper and lower ceramic-metal composite are cast in a base metal ("aluminum rolled stock 13" [0011])

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 6, 8, 11, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al (USPat. 5,835,334). McMillin teaches a susceptor (Figure 1; column 4, lines 9-18) in a processing vessel (not shown, column 4, lines 17-18) including:

i. A heater (17; Figure 3; column 7, lines 21-30 – see common 6a in Figures 1 and 3) arranged on a plane including piping ("cable")

ii. A upper (1c as part of "1"; column 4, lines 19-39) and lower (3; column 4, lines 15-18) ceramic-metal composite (Al_2O_3) arranged above and below the heater

iii. An electrostatic chuck ("base" 1 of 100; Figure 1) for holding an object (4; Figure 1) to be treated

iv. The electrostatic chuck (1 of 100; Figure 1) having a coefficient of linear thermal expansion substantially the same (column 5, lines 41-47 – at temperatures below 200°C) as that of the upper ceramic-metal composite and being joined to an upper ceramic-metal composite

v. The upper ceramic metal composite and the electrostatic chuck are formed by anodization, not brazed together as claimed by claim 8 - Because the examiner has provided a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between

the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Refer to MPEP 2113.

vi. The susceptor further configured so that a high frequency power electrode (2; column 5, lines 25-32) is provided as claimed by claim 11

vii. A plasma processing (title) apparatus comprising:

a. A processing vessel (not shown, column 4, lines 17-18)

b. A susceptor (Figure 1; column 4, lines 9-18) including:

i. A heater (17; Figure 3; column 7, lines 21-30 – see common 6a in Figures 1 and 3) arranged in a plane

ii. An upper (1c as part of "1"; column 4, lines 19-39) ceramic-metal composite arranged above the heater

iii. An lower ceramic-metal (3; column 4, lines 15-18) composite (Al_2O_3) arranged below the heater

iv. An electrostatic chuck (1 of 100; Figure 1) for holding an object to be treated, the electrostatic chuck (1 of 100; Figure 1) having a coefficient of linear thermal expansion substantially the same (column 5, lines 41-47 – at temperatures below 200°C) and being joined to an upper surface of the upper ceramic-metal composite

v. A high frequency power source (column 5, lines 25-33) that applies a high frequency voltage to the susceptor as claimed by claim 16

viii. The upper ceramic metal composite and the electrostatic chuck are formed by anodization, not brazed together as claimed by claim 19 - Because the examiner has

provided a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Refer to MPEP 2113.

McMillin does not teach that his electrostatic chuck is made of a ceramic material. However, McMillin does teach that his lower electrode (2) is made of a ceramic material (column 4, lines 10-13).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to use a ceramic material as the material of choice for McMillin's electrostatic chuck.

Motivation to use a ceramic material as the material of choice for McMillin's electrostatic chuck is to prevent cracking between McMillin's electrostatic chuck (1) and McMillin's anodized aluminum cap (column 5, lines 40-47).

6. Claims 2, 5, 7, 12, 13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al (USPat. 5,835,334) in view of Sagusa et al (JP09-165681). McMillin teaches a high frequency power electrode as discussed above and also including:

i. A heater (17; Figure 3) arranged on a plane

ii. A core metal plate (2; Figure 1) arranged parallel to the plane and adjacent the heater (see common 6a in Figures 1 and 3)

iii. The heater and the core metal plate are cast between a ceramic (1c, 3 - Al_2O_3)

McMillin et al differs from the present invention in that the heater and the core metal plate are encased in a ceramic, not a metal.

The teachings of Sagusa are discussed above.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to replace Sagusa's ceramic-metal composite (12, "cordierite ($2MgO$, $2Al_2O_3$, and $5SiO_2$) of ceramics" [0012]) and heater with McMillin's electrode (Figure 1) encased in Sagusa's base metal ("aluminum rolled stock 13" [0011]).

Motivation for McMillin to encase his electrode in Sagusa's base metal is taught by Sagusa as preventing "gas discharge within vacuum devices" ([0017]).

7. Claims 3, 4, 14, 15, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al (USPat. 5,835,334) and Sagusa et al (JP09-165681) in view of Wang et al (USPat. 5,755,886). McMillin and Sagusa are discussed above. McMillin and Sagusa do not teach a core metal plate comprising a plurality of base metal communication holes and such that the base metal is configured to adopt a shower head portion that supplies a gas. Wang teaches a gas manifold system (122, Figure 12).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to add borings for passing process gas and purge gas services to the apparatus of McMillin and Sagusa as taught by Wang.

Motivation for McMillin and Sagusa to add borings for passing process gas and purge gas services as taught by Wang is to provide for an even distribution of process gas across the surface of the wafer (column 4, lines 59-67).

8. Claims 9, 10, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al (USPat. 5,835,334). McMillin teaches alternative methods including "deposition,

spray, bonding, or other similar process" (column 3, lines 23-36), but not including forge-welding and adhering, for bringing together the upper ceramic metal composite and the electrostatic chuck.

It would have been obvious for one of ordinary skill in the art at the time the invention was made for McMillin to use alternative methods including forge-welding and adhering for bringing together the upper ceramic metal composite and the electrostatic chuck.

Motivation for McMillin to use alternative methods including forge-welding and adhering for bringing together the upper ceramic metal composite and the electrostatic chuck is drawn to equivalent and well known techniques for bringing together apparatus parts as taught by McMillin (column 3, lines 23-36).

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over McMillin et al (USPat. 5,835,334) in view of Fukasawa et al (USPat. 5,310,453). McMillin is discussed above. McMillin does not teach a heat transfer gas provided at the surface of the chuck. Fukasawa teaches a wafer support table (20, Figure 1) including a chuck electrode (10) with a heat transfer gas applied at its surface (column 6, lines 18-30).

It would have been obvious for one of ordinary skill in the art at the time the invention was made for McMillin provide a heat transfer gas at the surface of the chuck to enable temperature control of the wafer as taught by Fukasawa (column 6, lines 20-23).

Motivation for McMillin provide a heat transfer gas at the surface of the chuck to enable temperature control of the wafer as taught by Fukasawa for compensating heat between the chuck and the wafer W.

10. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watmough (USPat. 4,404,262) in view of Sagusa et al (JP09-165681).

Watmough teaches a method for manufacturing a metal-ceramic composite including:

i. Placing porous ceramics (12, column 3, lines 10-25) in a mold (22, Figures 1-8)

ii. Pouring a molten base metal (26) into the mold to cast porous ceramic with the base metal, thereby infiltrating the porous ceramic with the base metal in order to form a ceramic-metal composite (column 3, line 66 – column 4, line 14)

Watmough does not teach placing a heater inside the ceramic prior to the composite forming steps.

The teachings of Sagusa are discussed above. Specifically, Sagusa teaches a heater and the upper and lower ceramic-metal composite are cast in a base metal ("aluminum rolled stock 13" [0011]).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to cast the apparatus of Sagusa following the method of Watmough to form a ceramic-metal composite.

Motivation for Sagusa to follow the teachings of Watmough by forming a ceramic-metal composite is discussed by Watmough as providing added strength (column 1, lines 42-55).

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sagusa et al (JP09-165681)[2] in view of McMillin et al (USPat. 5,835,334). Sagusa and McMillin are discussed above. Sagusa does not teach a high-frequency powered electrode.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to add McMillin's high-frequency powered electrode (2) as part of the Sagusa apparatus.

Motivation to add McMillin's high-frequency powered electrode (2) as part of the Sagusa apparatus is to conduct plasma processing as taught by McMillin (column 4, lines 15-18).

12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sagusa et al (JP09-165681) in view of Wang et al (USPat. 5,755,886). Sagusa is discussed above. Sagusa does not teach that the base metal is configured to adopt a shower head portion that supplies a gas. Wang teaches a gas manifold system (122, Figure 12).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to add borings for passing process gas and purge gas services to the apparatus of Sagusa as taught by Wang.

Motivation for Sagusa to add borings for passing process gas and purge gas services as taught by Wang is to provide for an even distribution of process gas across the surface of the wafer (column 4, lines 59-67).

Response to Arguments

13. Applicant's arguments, see second paragraph, page 8, filed May 6, 2003, with respect to the rejection of claims 6, 8, 11, 16, 19, and 25 under Hirano et al (USPat. 6,120,661) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made in view of McMillin et al (USPat. 5,835,334).

14. With respect to Applicant's traversal of the claim 1 rejection, that a single element of an aluminum ceramic complex (12) cannot correspond to both an upper and lower ceramic-metal

composite, it remains the Examiner's opinion that Sagusa's heater is the plane that divides Sagusa's "single element" into both an upper and lower ceramic-metal composite as discussed above. Further, it remains the Examiner's opinion that Sagusa's heater and the upper and lower ceramic-metal composite are cast in a base metal ("aluminum rolled stock 13" [0011]).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.